
रिंग कताई और दोहरी स्पिंडल के लिए
ताना ट्यूबों की विशिष्टता

भाग 1 विशिष्ट अपेक्षाएं

(तीसरा पुनरीक्षण)

**Specification for Warp
Tubes for Ring Spinning and
Doubling Spindles**

Part 1 Specific Requirements

(*Third Revision*)

ICS 59.120.10

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FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textiles Machinery and Accessories Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1966 and subsequently revised in 1971 and 1983. The third revision has been made in the light of experience gained since its last revision and to incorporate the following major changes:

- a) All amendments have been incorporated;
- b) Requirement for material, dimensions, tolerance for dimension and concentricity have been modified;
- c) Marking and packing clause has been modified; and
- d) References to Indian Standards have been updated.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***SPECIFICATION FOR WARP TUBES FOR RING
SPINNING AND DOUBLING SPINDLES****PART 1 SPECIFIC REQUIREMENTS***(Third Revision)***1 SCOPE**

This standard (Part 1) prescribes requirements of warp tubes used in spinning and doubling frames. These tubes are suitable for use on aluminium plug type spindles with spring grips.

2 REFERENCE

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the

possibility of applying the most recent editions of the standards indicated in Annex A.

3 TYPES

This standard covers tubes of following types:

- a) Type A — Open top warp tube (*see* Fig. 1), and
- b) Type B — Rolled-in top warp tube (*see* Fig. 2).

4 TERMINOLOGY

For the purpose of this standard, the lift (of warp tube) shall mean the lift of spindle on which the tube is meant to be mounted or to be used.

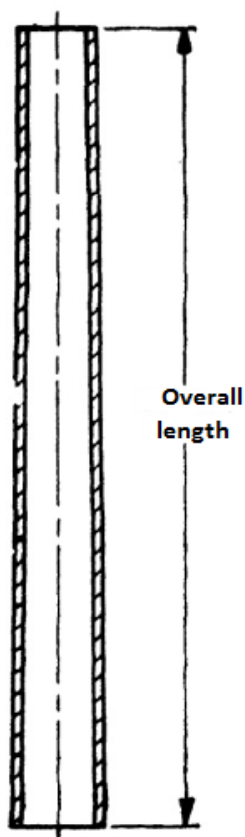


FIG. 1 A TYPICAL OPEN TOP WARP TUBE

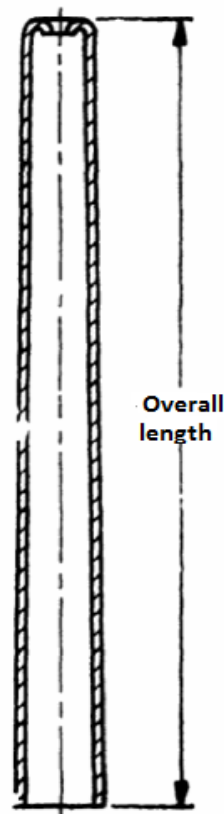


FIG. 2 A TYPICAL ROLLED IN TOP WARP TUBE

5 MANUFACTURE

5.1 Paper Tubes

The kraft paper and process employed for the manufacture of paper tubes shall ensure that the tubes are resistant to water absorption and/or steam conditioning, if so required by the buyer (see 6.3 and 6.4).

5.2 Plastic Tubes

The tubes shall be moulded from high density polyethylene having density above 0.9524 g/ml and melt index not exceeding 25.0 g/10 minutes (see IS 7328) or from poly-carbonate with minimum 5 percent and maximum 10 percent glass filler. The tubes to be subjected to steam conditioning shall be moulded from polypropylene copolymer or talc filled polypropylene or any other material as agreed to between the buyer and the seller.

5.2.1 The pigments used for colouring shall be those that are stable and do not bleed in contact with wet yarn during conditioning.

5.3 Shield

The shield if prescribed by the buyer shall be rigidly fixed.

5.3.1 Metal shield shall be made of either tinplate having minimum thickness of 0.315 mm or sheet of any other metal with suitable anti-rust treatment of thickness as agreed to between the buyer and the seller subject to a tolerance of ± 0.03 mm.

5.4 Finish

The surface of warp tubes shall be smooth. The warp tubes shall be any of the following finishes as required:

- a) Plain;
- b) Grooved;
- c) Ferruled; or
- d) Wrapped base.

6 REQUIREMENTS

6.1 Dimensions

6.1.1 Thickness — The thickness of tubes shall not be less than 2.6 mm.

6.1.2 Inside Diameter and Length of Plastic Tubes — The recommended inside diameters and lengths of plastic tubes of various tapers are given in subsequent parts of the standard. However, the length of tube as prescribed by the buyer shall be subject to the following tolerances:

Overall Length, mm	Tolerance, mm
Up to 230	± 1.0
231 to 300	± 1.0
301 to 340	± 1.0
341 to 500	± 1.0
501 to 740	± 1.0
741 and above	± 1.0

6.1.3 Inside Diameter and Length of Paper Tubes — The recommended inside diameters and lengths of paper tubes of various tapers are given in subsequent parts of the standard. However, the length of tube as prescribed by the buyer shall be subject to the following tolerances:

Overall Length, mm	Tolerance, mm
Up to 230	± 1.5
231 to 300	± 2.0
301 to 340	± 2.5
341 to 500	± 3.0
501 to 740	± 4.0
741 and above	± 5.0

NOTES

1 The length of type A tube is equal to the length of the blade of spindle which is normally equal to the lift of the spindle + 25 mm and the length of type B tube is equal to the lift of spindle + 35 mm.

2 The length shall be determined by direct measurement and not by plug gauge.

6.1.4 Fit of Tube — The fit of the tube on the spindle shall be determined by sliding it on the gauge having a taper equal to the taper of the tube (see Fig. 3) without undue pressure and without twisting. If the base of the tube lies within the two lines marked on the gauge, the warp tube shall be considered to be satisfactory in respect of fit. The two lines shall be marked at a distance of $\pm b/2$ from the nominal position (nominal bottom internal diameter) of the tube base on the gauge. The value for b shall be calculated as under:

$$b = \frac{D \times 3}{10}$$

where

b = fit tolerance; and

D = internal diameter at bottom.

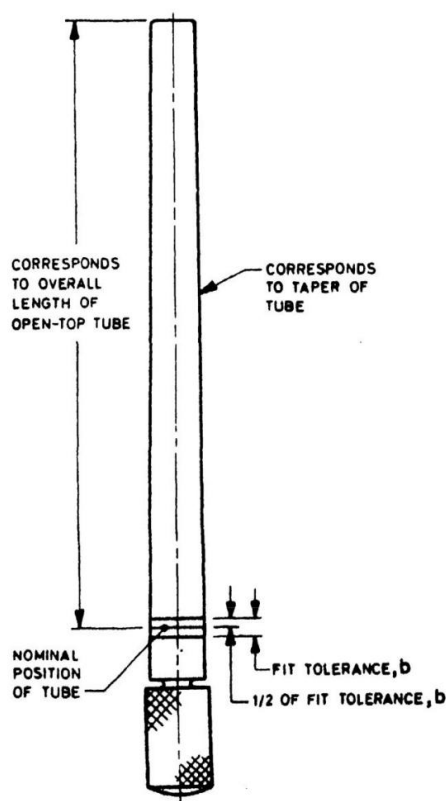


FIG. 3 A TYPICAL PLUG GAUGE

NOTES

1 The internal diameter of tube shall provide for a radial clearance of 0.2 mm at base and 0.1 mm at top for the spindle on which it is intended to be used unless otherwise required by the buyer.

2 The marks $\pm b/2$ at the small end of the gauge are used for checking the internal diameter at top of tube. For checking the internal diameter at base of tube by means of corresponding marks on the gauge, the tube should be cut into parts.

6.2 Concentricity — The tubes shall be concentric. However, eccentricity of 0.075 mm at the top and bottom shall be permissible when determined by a suitable test method as agreed to between the buyer and the seller.

6.3 Water Absorption — The paper tubes shall not gain more than 5 percent in weight when immersed in water at room temperature for 30 min.

6.4 Steam Conditioning — The tube shall not become distorted when subjected to the presence of steam at the conditions as may be prescribed by the buyer.

NOTE — The temperature of steam and the duration for which the tube shall be subjected for mild and rigorous conditions are normally as follows:

Condition	Temperature	Duration
Mild	90 °C	5 min
Rigorous	115 °C	30 min

6.5 Mass — The average mass of tubes shall be as agreed to between the buyer and the seller subject to a tolerance of ± 8 percent for paper tubes and ± 2 percent for plastic tubes. The mass of tubes is to be determined on a random sample of 100 tubes.

6.5.1 In case of dispute, the mass of paper tube shall be determined on the basis of oven-dry mass (at $103 \pm 2^\circ\text{C}$) plus 6 percent for moisture regain.

7 PACKAGING AND MARKING

7.1 The warp tubes shall be packed securely so as to allow normal handling and transport without damaging, tearing and exposing the contents. Details of the packing shall be as agreed to between the buyer and the seller. Packaging of the product shall be such as to maintain the integrity of the product throughout its shelf life.

7.2 If possible, each warp tube shall be marked at a suitable place with the following; otherwise this information shall be declared on the invoice:

- a) Manufacturer's name, initials or trade-mark;
- b) Specific characteristics of the tubes by the following notations;
 - 1) No conditioning — NC,
 - 2) Water conditioning — W,
 - 3) Mild steam conditioning — MS, or
 - 4) Rigorous steam conditioning — RS.
- c) Code or batch number (to trace back the history of production); and
- d) Any other statutory requirement as required by the law in force or agreed between the buyer and the seller.

7.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 The quantity of warp tubes manufactured from one definite material, of a definite lift, type and finish supplied to one buyer against one despatch note shall constitute a lot.

8.2 The conformity of the lot to the requirements of this standard shall be determined on the basis of the tests carried out on the samples selected from it.

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8.3 Unless otherwise agreed to between the buyer and the seller, the sample shall be selected as prescribed in **8.4** and **8.5**.

8.4 The number of cases to be selected from the lot shall depend on the size of the lot and shall be in accordance with column 1 and column 2 of Table 1.

8.4.1 The cases selected according to **8.4** shall constitute the gross sample.

8.5 The number of warp tubes to be tested and criterion for conformity for each of the characteristics shall be as follows:

<i>Characteristic</i>	<i>Numbers of Tubes to be Tested</i>	<i>Criterion for Conformity</i>
Concentricity	200 tubes from the gross sample drawn at random	Non-conforming tubes not to exceed 21

<i>Characteristic</i>	<i>Numbers of Tubes to be Tested</i>	<i>Criterion for Conformity</i>
Dimensions and fit tolerance	See column 3 of Table 1	Non-conforming tubes not to exceed the corresponding number given in column 4 of Table 1
Mass	100 tubes drawn from those already tested for dimensions and fit tolerance	The observed value shall satisfy the requirement
Taper, water absorption and steam conditioning	10 tubes drawn from those already tested for mass	Each observed value satisfies the requirement
NOTE — For the random selection of warp tubes, IS 4905 may be used.		

Table 1 Sample Size and Permissible Number of Non-conforming Warp Tubes

(Clauses 8.4 and 8.5)

No. of Cases in the Lot	No. of Cases to be Selected (Gross Sample)	No. of Warp Tubes to be Selected for Testing Dimensions	Permissible no. of Non Conforming Warp Tubes
(1)	(2)	(3)	(4)
Up to 3	All	100	2
4 to 6	4	125	3
7 to 14	5	200	5
15 and above	10	315	7

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)	7328 : 1992	High density polyethylene materials for moulding and extrusion — Specification (<i>first revision</i>)

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Textiles Machinery and Accessories, TXD 14

<i>Organization</i>	<i>Representative(s)</i>
Textile Machinery Manufacturers' Assn Mumbai	SHRI R. S. BACHKANIWALA (Chairman)
A T E Enterprises Pvt Ltd, Mumbai	SHRI ASHISH SHARMA SHRI VIKAS SHARMA (<i>Alternate</i>)
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Department of Heavy Industries Government of India, New Delhi	SHRI SANJAY CHAVRE
Harish Textile Engineers Pvt Ltd, Mumbai	SHRI ITENDRA H. SHAH
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Laxmi Shuttleless Looms Pvt Ltd, Ahmedabad	SHRI KETAN SANGHVI
Man-made Textile Research Association, Surat	DR S. K. BASU DR S. MATIZ (<i>Alternate</i>)
National Safety Council, Mumbai	SHRI LALIT R. GABHANE SHRI R. R. DEOGHARE (<i>Alternate</i>)
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SCIENTIST 'C' (TXD), BIS

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This Indian Standard has been developed from Doc No.: TXD 14 (15266).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi